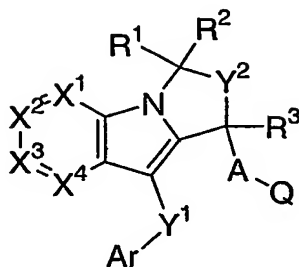


WHAT IS CLAIMED IS:

1. A compound having the formula I



I

and pharmaceutically acceptable salts and hydrates thereof, wherein:

A is selected from C₁₋₃alkyl optionally substituted with one to four halogen atoms, O(CH₂)₁₋₂, and S(CH₂)₁₋₂;

Ar is aryl or heteroaryl each optionally substituted with one to four groups independently selected from Rg;

Q is selected from:

- (1) COOH,
- (2) CONR^aR^b,
- (3) C(O)NHSO₂R^c,
- (4) SO₂NHR^a,
- (5) SO₃H,
- (6) PO₃H₂, and
- (7) tetrazolyl;

one of X¹, X², X³ or X⁴ is nitrogen and the others are independently selected from CH and C-Rg;

Y¹ is selected from -(CR^dR^e)_a-X-(CR^dR^e)_b-, phenylene, C₃₋₆cycloalkylidene and

C₃₋₆cycloalkylene, wherein a and b are integers 0-1 such that the sum of a and b equals 0, 1 or 2, and X is a bond, O, S, NR^a, C(O), CH(OR^a), OC(O), C(O)O, C(O)NR^a, OC(O)NR^a, NR^aC(O), CR^d=CR^e or C≡C;

Y² is selected from (CR^dR^e)_m and CR^d=CR^e;

R¹ is selected from H, CN, OR^a, S(O)_nC₁₋₆alkyl and C₁₋₆alkyl optionally substituted with one to six groups independently selected from halogen, OR^a and S(O)_nC₁₋₆alkyl;

R² is selected from H and C₁₋₆alkyl optionally substituted with one to six halogen; or

R¹ and R² together represent an oxo; or

R¹ and R² taken together form a 3- or 4- membered ring containing 0 or 1 heteroatom selected from NR^f, S, and O optionally substituted with one or two groups selected from F, CF₃ and CH₃;

R³ is selected from H and C₁₋₆alkyl optionally substituted with one to six groups independently selected from OR^a and halogen;

R^a and R^b are independently selected from H, C₁₋₁₀alkyl, C₂₋₁₀alkenyl, C₂₋₁₀alkynyl, Cy and Cy C₁₋₁₀alkyl, wherein said alkyl, alkenyl, alkynyl and Cy are optionally substituted with one to six substituents independently selected from halogen, amino, carboxy, C₁₋₄alkyl, C₁₋₄alkoxy, aryl, heteroaryl, aryl C₁₋₄alkyl, hydroxy, CF₃, OC(O)C₁₋₄alkyl, OC(O)NRⁱR^j, and aryloxy; or R^a and R^b together with the atom(s) to which they are attached form a heterocyclic ring of 4 to 7 members containing 0-2 additional heteroatoms independently selected from oxygen, sulfur and N-R^f;

R^c is selected from C₁₋₆alkyl optionally substituted with one to six halogen, aryl and heteroaryl, wherein said aryl and heteroaryl are optionally substituted with one to three groups selected from halogen, OC₁₋₆alkyl, O-haloC₁₋₆alkyl, C₁₋₆alkyl and haloC₁₋₆alkyl;

R^d and R^e are independently H, halogen, aryl, heteroaryl, C₁₋₆alkyl or haloC₁₋₆alkyl;

R^f is selected from H, C₁₋₆alkyl, haloC₁₋₆alkyl, Cy, C(O)C₁₋₆alkyl, C(O)haloC₁₋₆alkyl, and C(O)-Cy;

R_g is selected from

- (1) halogen,
- (2) CN,
- (3) C₁₋₆alkyl optionally substituted with one to eight groups independently selected from aryl, heteroaryl, halogen, NR^aR^b, C(O)R^a, C(OR^a)R^aR^b, SR^a and OR^a, wherein aryl, heteroaryl and alkyl are each optionally substituted with one to six groups independently selected from halogen, CF₃, and COOH,
- (4) C₂₋₆alkenyl optionally substituted with one to six groups independently selected from halogen and OR^a,
- (5) Cy
- (6) C(O)R^a,

- (7) C(O)OR^a,
- (8) CONR^aR^b,
- (9) OCONR^aR^b,
- (10) OC₁₋₆alkyl, wherein alkyl is optionally substituted with one to six substituents selected from halogen, aryl, heteroaryl, OH and OC(O)R^a,
- (11) O-Cy,
- (12) S(O)_nC₁₋₆alkyl, wherein alkyl is optionally substituted with one to six substituents selected from halogen, aryl, heteroaryl, OH, and OC(O)R^a,
- (13) S(O)_n-Cy,
- (14) -NR^aS(O)_nR^b,
- (15) -NR^aR^b,
- (16) -NR^aC(O)R^b,
- (17) -NR^aC(O)OR^b,
- (18) -NR^aC(O)NR^aR^b,
- (19) S(O)_nNR^aR^b,
- (20) NO₂,
- (21) C₅₋₈cycloalkenyl,

wherein Cy is optionally substituted with one to eight groups independently selected from halogen, C(O)R^a, OR^a, C₁₋₃alkyl, aryl, heteroaryl and CF₃;

Rⁱ and R^j are independently selected from hydrogen, C₁₋₁₀alkyl, Cy and Cy-C₁₋₁₀alkyl; or

Rⁱ and R^j together with the nitrogen atom to which they are attached form a ring of 5 to 7 members containing 0-2 additional heteroatoms independently selected from oxygen, sulfur and N-R^f;

Cy is selected from heterocyclyl, aryl, and heteroaryl;

m is 1, 2 or 3; and

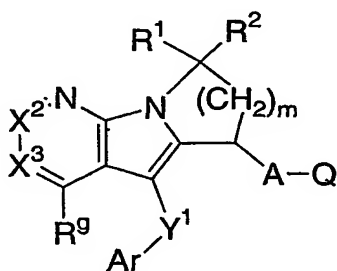
n is 0, 1 or 2.

2. A compound of Claim 1 wherein A-Q is CH₂CO₂H.

3. A compound of Claim 1 wherein Ar is naphthyl or optionally substituted phenyl wherein said substituents are 1 or 2 groups independently selected from R^g.

4. A compound of Claim 1 wherein Y¹ is selected from C(O) and S.

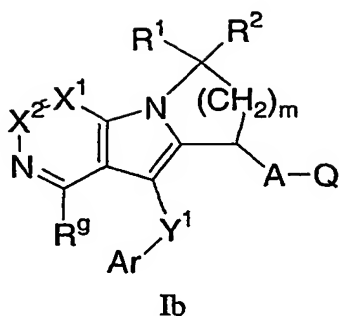
5. A compound of Claim 1 wherein one of X¹, X² and X³ is nitrogen and the others are independently CH or CR_g, and X⁴ is CR_g.
6. A compound of Claim 1 wherein one of X¹, X² and X³ is nitrogen and the others are CH, and X⁴ is C-S(O)_n-C₁₋₆alkyl or C-C₁₋₆alkyl optionally substituted with OR^a.
7. A compound of Claim 1 wherein R¹, R² and R³ are each hydrogen.
8. A compound of Claim 1 wherein Y² is selected from CH₂ and CH₂CH₂.
9. A compound of Claim 1 represented by the formula Ia:



Ia

wherein X² and X³ are independently CH or C-R_g, A, Ar, Q, Y¹, R¹, R², m and R_g are as defined in Claim 1.

10. A compound of Claim 9 wherein X² and X³ are each CH, R¹ and R² are each H, and A-Q is CH₂CO₂H.
11. A compound of Claim 9 wherein Y¹-Ar is S-phenyl optionally substituted with 1 or 2 groups independently selected from halogen, C₁₋₆ alkyl and trifluoromethyl.
12. A compound of Claim 1 represented by the formula Ib:

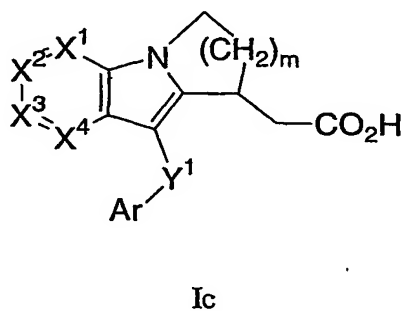


wherein X¹ and X² are independently CH or C-R_g, A, Ar, Q, Y¹, R¹, R², m and R_g are as defined in Claim 1.

13. A compound of Claim 12 wherein X¹ and X² are each CH, R¹ and R² are each H, and A-Q is CH₂CO₂H.

14. A compound of Claim 13 wherein Y¹-Ar is S-phenyl optionally substituted with 1 or 2 groups independently selected from halogen, C₁₋₆ alkyl and trifluoromethyl.

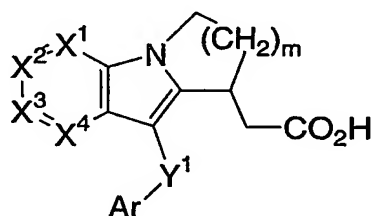
15. A compound of Claim 1 represented by the formula Ic:



wherein one of X¹, X² and X³ is N and the others are each CH, X⁴ is CR_g, m is 1 or 2, and Ar, Y¹ and m are as defined in Claim 1.

16. A compound of Claim 15 wherein Ar is phenyl optionally substituted with 1 or 2 groups independently selected from halogen, C₁₋₃alkyl and trifluoromethyl.

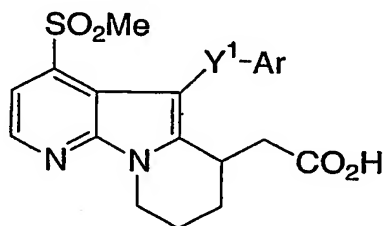
17. A compound of Claim 15 wherein Y¹ is S or C(O).
18. A compound of Claim 15 wherein X⁴ is selected from C-S(O)_n-C₁₋₆alkyl and C-C₁₋₆alkyl optionally substituted with OR_a.
19. A compound of Claim 15 wherein Y¹-Ar is S-phenyl optionally substituted with 1 or 2 groups independently selected from halogen, C₁₋₆alkyl and trifluoromethyl; X¹ and X² are each CH, X³ is N, m is 1 or 2, and X⁴ is C-SO₂C₁₋₆alkyl or C₁₋₆alkyl.
20. A compound of Claim 1 selected from:



| X ¹ | X ² | X ³ | X ⁴ | Ar | Y ¹ | m |
|----------------|----------------|----------------|-------------------------------------|-----------------------|----------------|---|
| N | CH | CH | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |
| N | CH | CH | C(SCH ₃) | 4-Cl-Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 3,4-diCl-Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 4-Cl-Ph | C(O) | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 4-Br-Ph | S | 2 |
| CH | CH | N | C(SO ₂ CH ₃) | 3,4-diCl-Ph | S | 1 |
| CH | CH | N | C(SO ₂ CH ₃) | 3,4-diCl-Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 4-CF ₃ -Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 2-Cl-4-F-Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 2-naphthyl | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 2,3-diCl-Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 4-CH ₃ -Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | Ph | S | 2 |
| N | CH | CH | C(SO ₂ CH ₃) | 2,4-diCl-Ph | S | 2 |
| CH | N | CH | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |

| X1 | X2 | X3 | X4 | Ar | Y1 | m |
|---------------------|---------------------|---------------------|---------------------------------------|-------------|----|---|
| CH | CH | N | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |
| N | C(CH ₃) | CH | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |
| N | CH | C(CH ₃) | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |
| CH | C(CH ₃) | N | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |
| C(CH ₃) | CH | N | C(SO ₂ CH ₃) | 4-Cl-Ph | S | 2 |
| N | CH | CH | C(CH(CH ₃) ₂) | 4-F-Ph | S | 2 |
| N | CH | CH | C(CH(CH ₃) ₂) | 4-Cl-Ph | S | 2 |
| N | CH | CH | C(CH(CH ₃) ₂) | 2,4-diCl-Ph | S | 2 |
| N | CH | CH | C(CH(CH ₃) ₂) | 4-Br-Ph | S | 2 |
| N | CH | CH | C(CH(CH ₃) ₂) | 2-Cl-4-F-Ph | S | 2 |
| N | CH | CH | C(CH(CH ₃) ₂) | 3,4-diCl-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 4-F-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 4-Cl-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 2,4-diCl-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 4-Br-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 2-Cl-4-F-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 3,4-diCl-Ph | S | 2 |
| CH | CH | N | C(CH(CH ₃) ₂) | 4-F-Ph | S | 1 |
| CH | CH | N | C(CH(CH ₃) ₂) | 4-Cl-Ph | S | 1 |
| CH | CH | N | C(CH(CH ₃) ₂) | 2,4-diCl-Ph | S | 1 |
| CH | CH | N | C(CH(CH ₃) ₂) | 4-Br-Ph | S | 1 |
| CH | CH | N | C(CH(CH ₃) ₂) | 2-Cl-4-F-Ph | S | 1 |
| CH | CH | N | C(CH(CH ₃) ₂) | 3,4-diCl-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 4-F-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 4-Cl-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 2,4-diCl-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 4-Br-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 2-Cl-4-F-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 3,4-diCl-Ph | S | 1 |
| CH | N | CH | C(CH(CH ₃) ₂) | 4-F-Ph | S | 2 |
| CH | N | CH | C(CH(CH ₃) ₂) | 4-Cl-Ph | S | 2 |
| CH | N | CH | C(CH(CH ₃) ₂) | 2,4-diCl-Ph | S | 2 |

| X1 | X2 | X3 | X4 | Ar | Y1 | m |
|----|----|----|--|-----------------------|----|---|
| CH | N | CH | C(CH(CH ₃) ₂) | 4-Br-Ph | S | 2 |
| CH | N | CH | C(CH(CH ₃) ₂) | 2-Cl-4-F-Ph | S | 2 |
| CH | N | CH | C(CH(CH ₃) ₂) | 3,4-diCl-Ph | S | 2 |
| N | CH | CH | C(CH(OCH ₃)(CH ₂ CH ₃)) | 4-Cl-Ph | S | 2 |
| N | CH | CH | C(CH(OCH ₃)(CH ₂ CH ₃)) | 4-Cl-Ph | S | 1 |
| CH | N | CH | C(CH(OCH ₃)(CH ₂ CH ₃)) | 4-Cl-Ph | S | 1 |
| CH | N | CH | C(CH(OCH ₃)(CH ₂ CH ₃)) | 4-Cl-Ph | S | 2 |
| CH | CH | N | C(CH(OCH ₃)(CH ₂ CH ₃)) | 4-Cl-Ph | S | 2 |
| CH | CH | N | C(CH(OCH ₃)(CH ₂ CH ₃)) | 4-Cl-Ph | S | 1 |
| N | CH | CH | C(C(CH ₃) ₃) | 4-Cl-Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 3,4-diCl-Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 4-Br-Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 4-CF ₃ -Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 2-Cl-4-F-Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 2-naphthyl | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 2,3-diCl-Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 4-CH ₃ -Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | Ph | S | 2 |
| N | CH | CH | C(C(CH ₃) ₃) | 2,4-diCl-Ph | S | 2 |



| | |
|----|----|
| Ar | Y1 |
|----|----|

| Ar | Y1 |
|----------------------------------|----|
| 5-tetrazolyl | S |
| 2-pyrrolyl | S |
| 1,2,4-triazol-3-yl | S |
| 1,2,3-triazol-4-yl | S |
| 5-imidazolyl | S |
| 4-pyrazolyl | S |
| 5-pyrazolyl | S |
| (1H,4H)-5-oxo-1,2,4-triazol-3-yl | S |
| 4-isothiazolyl | S |
| 1,2,5-thiadiazol-5-yl | S |
| 1,2,5-oxadiazol-5-yl | S |
| 3-furanyl | S |
| 1,2,3-thiadiazol-4-yl | S |
| 1,2,3-oxadiazol-4-yl | S |
| 4-isoxazolyl | S |
| 3-thienyl | S |
| 4-oxazolyl | S |
| 4-thiazolyl | S |
| (5H)-2-oxo-5-furanyl | S |
| (5H)-2-oxo-4-furanyl | S |
| 1,2,4-oxadiazol-5-yl | S |
| 3-pyridyl | S |
| 2-pyrazinyl | S |
| 5-pyrimidinyl | S |
| 2-indolyl | S |
| 2-benzothieryl | S |
| 2-benzofuranyl | S |
| 4-oxo-benzopyran-2-yl | S |
| 2-quinolinyl | S |
| 2-benzimidazolyl | S |
| 2-benzoxazolyl | S |
| 2-benzothiazolyl | S |

| Ar | Y1 |
|---------------------------|-------------------|
| 1-benzotriazolyl | CH ₂ S |
| thieno[2,3-b]pyridin-2-yl | S |

21. A pharmaceutical composition comprising a compound of formula I as defined in any one of Claims 1 to 20, or a pharmaceutically acceptable salt or hydrate thereof, and a pharmaceutically acceptable carrier.

22. The composition of Claim 21 further comprising a second active ingredient selected from an antihistamine, a leukotriene antagonist and a leukotriene biosynthesis inhibitor.

23. A method for the treatment of prostaglandin D₂ mediated diseases which comprises administering to a patient in need of such treatment a therapeutically effective amount of a compound of Claim 1.

24. A method for the treatment of nasal congestion which comprises administering to a patient in need of such treatment a therapeutically effective amount of a compound of Claim 1.

25. A method for the treatment of allergic asthma which comprises administering to a patient in need of such treatment a therapeutically effective amount of a compound of Claim 1.

26. A method for the treatment of allergic rhinitis which comprises administering to a patient in need of such treatment a therapeutically effective amount of a compound of Claim 1.

27. A compound of formula I, as defined in any one of Claims 1 to 20, or a pharmaceutically acceptable salt or soluate thereof, for use in medicinal therapy.

5 28. A compound salt or hydrate of Claim 27 for use in treatment of prostaglandin D2 mediated diseases.

29. Use of a compound of formula I, as defined in any one of Claims 1 to 20, or a pharmaceutically acceptable salt or soluate thereof, in the
10 manufacture of a medicament for treatment of nasal congestion, allergic asthma or allergic rhinitis.

30. A prostaglandin receptor antagonist pharmaceutical composition comprising an acceptable antagonistic amount of a compound of
15 formula I, as defined in any one of Claims 1 to 20, or a pharmaceutically acceptable salt or soluate thereof, in association with a pharmaceutically acceptable carrier therefor.